Fireworks - Related Injuries

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Legislation passed this year by the Indiana General Assembly (HEA 1131) requires physicians, hospitals, and outpatient surgery centers to report all injuries resulting from fireworks or pyrotechnics to the Indiana State Department of Health. This report presents data compiled from reports received from May 13 – July 19, 2003.

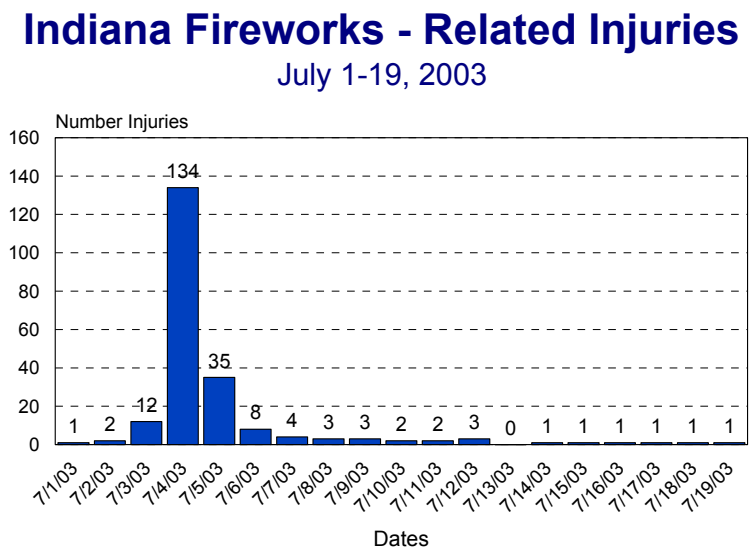
Highlights

- As of July 19th, there were 261 unduplicated cases reported to ISDH.
- Fifty-three percent of all fireworks-related injuries reported involve children and adolescents, who represent a fourth of the population in Indiana.
- Three fourths of cases reported sustained burn injuries, with burns of the hands being the most common type of injury.
- About 20% of all injuries reported involved the eyes, with 82% of those with eye injuries not using any method of eye protection.
- Eleven percent of injured persons required either hospital admission or specialized care for burns or eye injuries.
- Sparklers, rockets and firecrackers were associated with 63% of all injuries reported.
- Fireworks use on private property accounts for more than 80% of the injuries reported.

Fireworks-Related Injuries

- Seventy-three percent (190) of the reported injuries involved males and 27% (71) involved females.
- Eighty-four percent (219) of the injuries occurred among whites; Black/African Americans accounted for 10% (25) of all injuries.
- The median age of those injured was 18 years (average=20 years; range=6 weeks to 74 years).
- The first case was reported on May 13, 2003 with a total of three cases reported for the month of May. Thirty-one cases were reported in June and 216 cases were reported in July.
- Fifty-two percent (134) of the injuries occurred on July 4th and 76% (189) of all injuries occurred between July 3 and 6.

Figure 1.



The types of fireworks most frequently resulting in injury (63% in total) were sparklers, rockets, and firecrackers (Table 1). Injuries from many other types of fireworks were also reported, including ¼ stick of dynamite, smoke bombs, and spewed strobe lights. Although 27% (70) of the reports noted that the injury resulted from mishandling fireworks, 36% (95) reported that the injury resulted from fireworks malfunction or an errant path of a rocket.

Seventy-six percent (198) of the cases experienced injury from burns. Of these, seventy% (139) received second-degree burns and 7% (13) had third degree burns. Other types of injuries included contusions/lacerations/abrasions (48 cases), penetrating foreign body/missiles (16 cases), puncture wounds (6 cases) and sprains/fractures (2 cases). One-half of injuries involved the hands or eyes, although injuries to many parts of the body were reported (Table 2).

Among the 92% (240) of cases who reported the location of the activity that resulted in injuries, 59% of injuries (142) occurred at the injured person's private home, yard, or property. A friend, neighbor, or relative's home or property was involved in 24% (57); public property was noted for 10% (24).

Although most reports (226) did not provide information on alcohol consumption, 13% (35) stated that alcohol was imbibed before to the injury and 26 of these noted alcohol use within three hours of the injury. Three adolescents reported using alcohol. An additional 10% (25) of the injury reports stated that other people at the scene used alcohol.

Fourteen percent (37) of all people injured were bystanders. Among those injured who were less than 18 years of age, 60% (83) of the injuries happened while in the presence of an adult.

Table 1: Frequency of Type of Fireworks Involved in Injury, All Injuries.

Type of Fireworks / Pyrotechnics	Frequency	Percent
Sparkler	61	23.4%
Rockets (i.e., bottle rockets)	56	21.5%
Firecrackers	48	18.4%
Aerial Devices	21	8.0%
Pyrotechnics*	15	5.7%
Twister / "Jumping Jacks"	8	3.1%
Lightning Gunpowder	3	1.1%
Homemade, altered devices	2	0.8%
Unspecified / Unknown / Other	47	18.0%
Total	**261**	**100%**

*Upon review of the reported injuries, the Office of the State Fire Marshal determined that only 1 of the 15 reported pyrotechnic related injuries actually resulted from a true indoor pyrotechnic display. The 14 other reported pyrotechnic related injuries resulted from outdoor fireworks displays.

Table 2. Frequency of Body Part Injured, All Injuries.

Body Part Involved**	Frequency**	Percent of Injured Persons**	Percent of All Injuries**
Hand	114	43.7%	34.2%
Eye	57	21.8%	17.1%
Leg	46	17.6%	13.8%
Face/Ears/Head	40	15.3%	12.0%
Arm	39	14.9%	11.7%
Trunk	30	11.5%	9.0%
Other	7	2.7%	2.1%
Total	**333**	**127.6%**	**100%**

**Not mutually exclusive, some cases received injuries to multiple body parts.

Children: Six Weeks Through Eleven Years of Age

There were 78 (55 male and 23 female) injuries reported in children. The types of fireworks mainly resulting in injury included sparklers (32 cases), rockets (13 cases) and firecrackers (11 cases). Burns were sustained by 85% (66) of the cases in this age group. The majority of these injuries (72% or 56) happened in the presence of an adult. Twelve of the injured children were bystanders. The only child admitted to a hospital was a one-year old bystander who sustained first and second degree burns.

Adolescents: Twelve Through Eighteen Years of Age

Among adolescents, there were 60 fireworks-related injuries, involving 46 males and 14 females. Seventy-three percent of the cases experienced burn injuries. One person sustained probable loss of vision in the left eye. Two cases were admitted to hospitals. Four cases were transferred to or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers). Twenty-seven injuries (45%) occurred while in the presence of an adult. Eight of the injured were bystanders.

Adults: Nineteen Years of Age and Older

There were 123 injuries (47% of all cases) reported among those aged nineteen years. Seventy-two percent (88) of the adults experienced burn injuries. Hand injuries were reported 61 times. Of the 22 cases with eye injuries, sixteen were not wearing eye protection and two had eyeglasses or safety glasses (four unknowns). Six cases were admitted to hospitals. Eleven cases were transferred to or re-evaluated at more specialized healthcare sites (i.e., burn centers, eye centers). The use of alcohol was reported by 26% (32) of injured adults. Seventeen of the injured cases were bystanders.

Summary

For the 261 cases of fireworks-related injury that comprise this report, three-fourths of all injuries reported occurred from July 3rd- 6th, including 52 (134)% of injuries that took place on Independence Day. While those injured ranged in age from 6 weeks to 74 years, children and adolescents comprised over one-half (53%) of the reported cases. According to the 2000 U.S. Census population estimates for Indiana, persons under 18 years of age represent only a fourth of the population. Adults were present 60% of the time for injuries reported in children and adolescents. Males were involved in almost three-fourths of all cases reported, which is a common finding for many traumatic injuries. The racial distribution of those injured was similar to that of the population of Indiana.

As expected, burns were the most frequent type of injury, involving 76% (198) of all reported cases. While the hands were the body part most commonly injured (34%), injuries to the eye (17%) were also quite frequent, with the great majority (82%) of those with eye injuries reporting no method of eye protection in use. Bystanders were injured in 14% (37) of reported cases. Hospital admission was needed for 3.4% of those injured, with an additional 7.7% requiring specialized care for either burn injuries or eye injuries. There were no deaths reported related to fireworks injuries during the time period of this report.

When the location of the activity using fireworks was identified, 83% (199) of cases reported occurred at private home, yard, or property (self-owned or friend, neighbor or relative). The type of fireworks involved in injuries varied somewhat by age, with sparklers causing the most injuries in young children, rockets, sparklers and firecrackers involved in adolescents, and a fairly equal distribution of these three types of fireworks also affecting injured adults.

Mishandling or malfunction of fireworks was the most frequent mechanism reported for fireworks-associated injury, accounting for about one-half of all those injured. Although alcohol use was not stated for 87% of the reported cases, alcohol use occurred at the scene of activities affecting injured persons of all age groups. One-quarter of the adults injured reported the use of alcohol.

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